

Appl. No. 09/871,013

Amdt. Dated November 5, 2003

Reply to Office Action of August 5, 2003

REMARKS/ARGUMENTS

Reconsideration of the application is requested.

Claims 1-18 are now in the application. Claims 1, 4, 6, 7, and 10 have been amended. Independent claim 11 and dependent claims 12-18 have been added.

In item 3 on page 2 of the above-identified Office Action, claims 1-10 have been rejected as being unpatentable over Goldberg et al. (U.S. Patent 5,511,428) (hereinafter "Goldberg") in view of Chu et al. (U.S. Patent 6,217,724 B1) (hereinafter "Chu") under 35 U.S.C. § 103(a)

The rejection has been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found on page 13, line 25 to page 14, line 18 of the specification of the instant application and in the original claims.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 1 calls for, *inter alia*, a method for electrically contacting a rear side of a semiconductor substrate when

Appl. No. 09/871,013

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processing the semiconductor substrate, the method having the steps of:

providing a substrate holder having a vacuum line for producing a vacuum;

forming a first trench in the electrically conductive contact layer starting from a first surface of the electrically conductive contact layer;

forming a second trench in the electrically conductive contact layer starting from a second surface of the electrically conductive contact layer;

forming a hole in the electrically conductive contact layer extending from the first surface of the electrically conductive contact layer to the second surface of the electrically conductive contact layer; and

applying a vacuum to the vacuum line, feeding the vacuum through the hole from the second surface of the electrically conductive contact layer to the first surface of the electrically conductive contact layer, and distributing the vacuum uniformly over the rear side of the semiconductor

Appl. No. 09/871,013

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substrate. (emphasis added) Independent claims 10 and 11 contain similar features.

According to the present invention as claimed, there is provided a method of contacting the rear side of a semiconductor substrate through applying a vacuum through a vacuum line of a substrate holder and feeding the vacuum to the rear side of the semiconductor substrate by trenches on either side of the contact layer and by a hole extending through the contact layer. The vacuum is distributed uniformly over the rear side of the substrate. The substrate and the conductive layer contact layer are doped with the same polarity of dopants (as further described on page 14, lines 20-21 of the instant specification).

The Goldberg reference discloses a sensor microstructure contact arrangement for making backside contact to mechanical microstructures. In Goldberg the contact layer 12 is permanently fixed to the substrate 30. A trench 24 is shown disposed between layer 12 and substrate 30. However, the trench is not connected to side 17 of layer 12 and therefore, cannot serve to distribute a vacuum, let alone a vacuum for holding a substrate to a substrate holder. Because the layer 12 is permanently fixed to the substrate 30, there is absolutely no reason or need to hold the substrate to the

Appl. No. 09/871,013

Amdt. Dated November 5, 2003

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substrate holder through a vacuum. Consequently, the features and operational aspects of the present claimed invention are distinctly patentably different from the method and configuration disclosed in Goldberg. Goldberg does not show or teach using a vacuum to hold the stack of semiconductor substrate, the electrically conductive layer, and the substrate holder together. Moreover, Goldberg does not disclose the use of pressure in the trench (for example, see claim 9). The through holes 14a and 24b in Goldberg are filled with a conductive layer or material (see col. 6, line 25). Therefore, the through holes 14a and 24b cannot function to apply a vacuum to the backside of the substrate 30.

Goldberg does not show "providing a substrate holder having a vacuum line for producing a vacuum", "forming a hole in the electrically conductive contact layer extending from the first surface of the electrically conductive contact layer to the second surface of the electrically conductive contact layer", and "applying a vacuum to the vacuum line, feeding the vacuum through the hole from the second surface of the electrically conductive contact layer to the first surface of the electrically conductive contact layer, and distributing the vacuum uniformly over the rear side of the semiconductor

Appl. No. 09/871,013

Amdt. Dated November 5, 2003

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substrate" as recited in claim 1 of the instant application.

Independent claims 10 and 11 contain similar limitations.

Chu discloses a plasma treatment system for implantation with a susceptor with a silicon coating. The system has a susceptor located in a chamber to support a silicon substrate. Chu does not disclose a holding a substrate to a substrate holder by using a vacuum. Nor does Chu make up for the deficiencies of Goldberg discussed above.

Moreover, there is absolutely no basis or reason for combining Chu with Goldberg as suggested by the Examiner. It is respectfully submitted that merely "because the system has a substrate holder disposed in the chamber to support a silicon substrate" (as disclosed in the second sentence of Chu's Abstract) is not sufficient justification or motivation for one skilled in the art to combine Chu with Goldberg as proposed by the Examiner. The Examiner is overreaching in his proposed combination of references and is relying on nothing more than hindsight reconstruction of the prior art after having read applicants' invention. There is no reason why one skilled in the art would even consider the non-analogous disclosure of Chu relative to Goldberg's sensor contact microstructure contact scheme other than hindsight. The

Appl. No. 09/871,013

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Examiner simply has formed a mosaic of two distinctly different pieces of prior art in an unsuccessful attempt to show applicants' novel and unique invention as recited in the claims. The Examiner has read applicants claimed invention, selected a single primary prior art reference that shows features of the present claimed invention and determined which claimed features are not disclosed in that reference, and then sought disclosure of those features missing from the primary reference in other secondary prior art references, and concluded that it is obvious to combine the secondary reference with the primary reference. Such a combination of references is clearly based on hindsight that would not have been arrived at but for applicants' claimed invention. It is submitted that the Examiner's combination of prior art is improper and incorrect, and with sufficient basis.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1, 10, and 11. Claims 1, 10, and 11 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claims 1, 10, or 11.

Appl. No. 09/871,013

Amdt. Dated November 5, 2003

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In view of the foregoing, reconsideration and allowance of claims 1-10 and new claims 11-18 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

If an extension of time for this paper is required, petition for extension is herewith made.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

  
For Applicants

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FDP/ck

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